Seattle Aquarium Citizen Science:Inspiring Marine Conservation in our Local Students

Mark Plunkett, Conservation Coordinator
Seattle Aquarium, 1483 Alaskan Way, Seattle, WA 98101

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PROGRAM DESCRIPTION

Citizen Science is a volunteer-based program designed to collect long-term and scientifically significant data on nearshore habitat and wildlife of seven Seattle area marine reserves. Trained high school students from traditionally underserved populations will form the core of the work force.

PURPOSE OF CITIZEN SCIENCE

- Engage students in "real world" science while sparking their wonder with the marine environment
- Inspire historically under-represented students to advance with inquiry-based science
- Support Washington State Essential Academic Learning Requirements
- Bridge the gap between the need for habitat protection and public involvement in wildlife management
- Create an ongoing monitoring system of recently established Seattle marine protected areas

COMPONENTS OF CITIZEN SCIENCE

- Teacher training and support in implementing Citizen Science into existing curricula
- 20 hours of classroom, inquiry-based instruction followed by testing on animal and plant identification by each of the five participating teachers
- One three-hour classroom-based methodology training session conducted by Aquarium staff at each of the five schools
- One three-hour, inquiry-based field training session conducted by Aquarium staff
- One four-hour field trip to conduct a beach characterization survey
- One four-hour field trip to conduct a biological survey of the beach

METHODOLGY

The study will monitor changes in the ecological condition of Puget Sound rocky beaches using epifauna and macroflora as indicators of change. Intertidal assessment will include yearly:

- Habitat characterization:
  - Backshore elevation
  - Beach slope along a profile line from the backshore to -2.0' tide
  - Substrate composition within 10' wide sections along profile line
  - Habitat type – substrate + overlying vegetation – along profile line
  - Water temperature and salinity

- Mean sea level

continued
page 2

- Relative abundance transects:
  - 24 key species or groups of species monitored
  - criteria for selection include:
    - ease and accuracy of sampling
    - not buried so as to reduce impact on environment and volunteers
    - taxa selected to include all trophic levels within the local intertidal community
  - species are grouped if there is no significant ecological difference between them, e.g., barnacles and limpets
  - 50 meter transect line running parallel to the shore at the 0' tide (MLLW)
  - Ten randomly selected 0.25 m² quadrats (50cm x 50cm) sampled along transect
  - Mobile species (or groups) counted
  - Sessile species (or groups) documented with "percent cover", e.g. barnacles, anemones and vegetation
  - One beach with extensive sandy sections will be sampled for clams in addition to the above – one cubic foot sample will be dug and all selected bivalves greater than ½" in size will be weighed, measured on beach and returned

- Biodiversity survey:
  - All species of epifauna and macroflora along the profile line will be counted for presence or absence
  - Birds and mammals observed on/near the beach will be documented

QUALITY CONTROL

- All students must pass a competency test to assure knowledge of species identification and methodology skills
- Data entry/certification will occur at the Seattle Aquarium by the Conservation Coordinator
- Data analysis/management to be supervised by the Seattle Aquarium Curator of Animal Health/Research.
- Program development overseen by 19- member Steering Committee representing scientific and educational experts from the West Coast
- Scientific protocol vetted by a 14-person team of local marine scientists who also provide on-going scientific oversight
- Data and reports to be shared with students, scientists and planners to encourage inquiry-based learning and conservation planning

EDUATIONAL EVALUATION

- Pre and post assessments of students will be conducted by a professional field science evaluator

- Detailed reports with statistical analysis will be provided to Seattle Aquarium, program partners and all participating teachers

continued
page 3

PARTNERS
Seattle Aquarium Society
Discuren Foundation
City of Seattle
City of Burien
King County
Washington Dept. of Natural Resources
Univ. of Washington
Environmental Science Center
Highline School District
Seattle School District
WSU/Island County Beachwatchers
Dept. of Fisheries/Oceans Canada